Claims:

1. A method for coding an audio signal, **characterized** in that at least the following steps are performed:

- examining a part of the audio signal to be coded to find another part of the audio signal which substantially corresponds to the part of the audio signal to be coded,
- producing a set of predicted signals on the basis of the substantially corresponding part of the audio signal using a set of pitch predictor orders,
- determining a coding efficiency for at least one of said predicted signals, and
- using the determined coding efficiency to select a coding method for the part of the audio signal to be coded.

2. The method according to claim 1, **characterized** in that the selectable coding methods comprise a method in which the audio signal to be coded is coded on the basis of a predicted signal.

3. The method according to claim 2, **characterized** in that the selectable coding methods comprise a method in which the audio signal to be coded is coded on the basis of the audio signal itself.

4. The method according to claim 1, **characterized** in that a coding error is determined for each of said predicted signals.

5. The method according to claim 4, **characterized** in that the coding efficiency is defined for the predicted signal having the smallest said coding error, and that the coding is performed on the basis of the predicted signal having the smallest said coding error if the determined coding efficiency information indicates that the amount of coded information is less than if the coding is performed on the basis of the part of the audio signal to be coded.

6. The method according to claim 5, **characterized** in that the part of audio signal to be coded is transformed into the frequency domain to determine the frequency spectrum of the audio signal, and each predicted signal is transformed into the frequency domain to determine

the frequency spectrum of each predicted signal, and that said coding efficiency is determined for said predicted signal having the smallest coding error on the basis of the frequency spectrum of the audio signal, and the frequency spectrum of the predicted signal.

7. The method according to claim 1, **characterized** in that a coding efficiency is determined for each of said predicted signals and a coding error is determined for those predicted signals for which the determined coding efficiency information indicates that the amount of coded information is less than if the coding is performed on the basis of the part of the audio signal to be coded and the coding is performed on the basis of the predicted signal that provides the smallest coding error.

8. The method according to claim 1, **characterized** in that a coding efficiency is determined for each of said predicted signals and the coding is performed on the basis of the predicted signal that provides the highest coding efficiency, if the determined coding efficiency information indicates that the amount of coded information is less than if the coding is performed on the basis of the part of the audio signal to be coded.

9 The method according to claim 1, **characterized** in that a coding efficiency is determined for each of said predicted signals and the coding is performed on the basis of the predicted signal that provides the highest coding efficiency.

10. The method according to claim 7, ~~8 or 9,~~ **characterized** in that the part of audio signal to be coded is transformed into the frequency domain to determine the frequency spectrum of the audio signal, and each predicted signal is transformed into the frequency domain to determine the frequency spectrum of each predicted signal, and that said coding efficiency is determined for each predicted signal on the basis of the frequency spectrum of the audio signal, and the frequency spectrum of the predicted signal.

11. The method according to claim 5, ~~6, 7, 8 or 9,~~ **characterized** in that prediction error information is determined for each of said predicted signals.

12. The method according to claim 5, ~~6, 7, 8 or 9,~~ **characterized** in that said predicted signals are formed by using a different prediction order for each of said predicted signals.

13. The method according to claim 6 ~~or 10,~~ **characterized** in that said prediction error information determined for each of said predicted signals is calculated as a difference spectrum representing using said frequency spectrum of the audio signal and the frequency spectrum of the predicted signal.

14. The method according to claim 10 ~~or 13,~~ **characterized** in that the transformation to the frequency domain is conducted using a modified DCT transform.

15. The method according to ~~any of claims 1 to 14,~~ claim 1 **characterized** in that the coded information (501) of the predicted signal comprises at least data relating to the coding method (502), data relating to the selected order (504), a lag (505), pitch predictor coefficients (506) and data relating to the prediction error (507).

16. The method according to ~~any of claims 1 to 15,~~ claim 1 **characterized** in that the audio signal is divided into frames, wherein the coding is performed separately for each frame formed from the audio signal.

17. The method according to ~~any of claims 1 to 16,~~ claim 1 **characterized** in that the audio signal is a speech signal.

18. The method according to ~~any of claims 4 to 7,~~ claim 4 **characterized** in that said coding error is determined using one of the following:

- a least squares method;
- a method based on psychoacoustic modelling of the audio signal to be coded.

19. The method according to claim 18, **characterized** in that if said coding error is determined using the least squares method, the coding error is calculated from the prediction error.

20. The method according to ~~any of claims 1 to 19~~, **characterized** in that said coded audio signal is transmitted to a receiving device.

21. A data transmission system which comprises means (16, 20) for coding an audio signal, **characterized** in that the data transmission system also comprises

- means (7, 8) for examining a part of the audio signal to be coded to find another part of the audio signal which substantially corresponds to the part of the audio signal to be coded,
- means (9, 10) for using a set of pitch predictor orders to produce a set of predicted signals on the basis of the substantially corresponding part of the audio signal,
- means (12) for determining a coding efficiency for at least one of said predicted signals,
- means (12, 13, 14) for using the determined coding efficiency to select a coding method for the part of the audio signal to be coded, and
- means (16) for transmitting the coded audio signal.

22. The data transmission system according to claim 21, **characterized** in that it comprises means for determining a coding error for at least one of said predicted signals.

23. The data transmission system according to claim 21, **characterized** in that it comprises means for transforming the part of audio signal to be coded into the frequency domain, and means for transforming each predicted signal into the frequency domain.

24. The data transmission system according to 21, **characterized** in that it comprises means to form a bit string (15) for transmission to a receiving device, said bit string comprising at least information concerning the selected coding method.

25. The data transmission system according to ~~any of claims 21 to 24~~, **characterized** in that it comprises means for dividing the audio signal into frames.

26. The data transmission system according to ~~any of claims 21 to 25,~~ **characterized** in that it comprises a mobile terminal.

27. A encoder (1) which comprises means (16, 20) for coding an audio signal, **characterized** in that the coder comprises

- means (7) for examining a part of the audio signal to be coded to find another part of the audio signal which substantially corresponds to the part of the audio signal to be coded,
- means (9, 10) for using a set of pitch predictor orders to produce a set of predicted signals on the basis of the substantially corresponding part of the audio signal,
- means (12) for determining a coding efficiency for at least one of said predicted signals, and
- means (12, 13, 14) for using the determined coding efficiency to select a coding method for the part of the audio signal to be coded.

28. The encoder (1) according to claim 27, **characterized** in that it comprises means (4, 6-14) to code the audio signal on the basis of a predicted signal

29. The encoder (1) according to claim 28, **characterized** in that it comprises means (4, 6, 14) to code the audio signal itself.

30. A decoder (33) for decoding an audio signal coded in a encoder according to claim 27, **characterized** in that the decoder comprises means for determining the coding method of the audio signal to be decoded, and means for decoding the audio signal according to the determined coding method.

31. A decoder according to claim 30, **characterized** in that the decoder comprises means (21) for receiving information relating to a predicted signal.

32. A decoder according to claim 31, **characterized** in that the decoder comprises means (24, 28) for producing a predicted signal on the basis of the received information.

33. A decoder according to claim 31 ~~or 32~~, **characterized** in that the decoder comprises means (21) for determining from said received information at least data relating to a selected order (504), a lag (505), at least one pitch predictor coefficient (506) and prediction error data (507).

34. A decoder according to claim 33, **characterized** in that it comprises means (24, 28) for producing a predicted signal using said data relating to a selected order (504), a lag (505), and at least one pitch predictor coefficient (506).

35. A decoder according to claim 33 ~~or 34~~, **characterized** in that it comprises means (23, 24, 28) for producing a reconstructed audio signal using said predicted signal and said prediction error data.

36. A decoder according to claim 30, **characterized** in that it comprises means (21) for receiving information relating to the audio signal itself.

37. A decoder according to claim 36, **characterized** in that it comprises means (22, 23, 26) for producing a reconstructed audio signal using said received information relating to the audio signal itself.

38. A method for decoding an audio signal which is coded according to the method of claim 1, **characterized** in that the coding method of the audio signal to be decoded is determined, and the decoding is performed according to the determined coding method of the audio signal.

39. A method according to the claim 38, **characterized** in that the coding method is one of the following alternatives:

- A method in which the audio signal is coded using a pitch predictor of a given order,
- A method in which the audio signal is coded on the basis of the audio signal itself